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Calf Diseases*

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The outlook in medicine has changed throughout the centuries. In early times quite an amount was known of the symptoms, modes of termination and prognosis of many human and animal diseases; during the 18th century more attention was focused on morbid anatomy and towards the latter part of the 19th century and the early part of this a considerable amount of light was thrown upon the causes of diseases, especially the infectious ones. We have been living through a bacteriological era and are disappointed because the hopes that were held out by the early bacteriologists have not been entirely justified. It was imagined that the microbe of an infectious disease could be, if not in all cases at least in most, converted to a vaccine and used as a protective injection. The more we study bacteria and viruses, however, the more complicated the problem of immunisation appears to be; we either find that one so-called species of bacterium is really a collection of antigenic types and immunisation seems hopeless, or else we are unable to change a pathogenic bacterium to a harmless but potent vaccine.

The change of outlook still goes on and to-day we live in the age of the nutritionist and endocrinologist. As some bacteriologists were prone to explain all diseases in terms of infection, so some nutritionists would explain all diseases in terms of faulty nutrition. As with most problems, the truth probably lies between, and disease is often due to the upset of some balance.

What has this to do with calf diseases? Quite a lot, because the equilibrium which calves are called upon to establish with the outside world is much more delicately balanced than that obtaining with adult cattle. Furthermore, few diseases are due to a single cause and this is particularly true of calves; those bacteria which are credited with causing disease and death in calves are not usually of high pathogenicity.

There is another point I would make concerning our outlook. It was customary for our ancestors to attempt to cure diseases rather than concern themselves with the health of the animals. Veterinary surgeons were not regarded as guardians of the health of animals, but were expected to cure the sick. The importance of preventive medicine has been realised for many years and some of the older practitioners were led to expect that the day would come when their chief employment would be that of an "immuniser." Success in preventive medicine does not lie in that direction alone, for immunisation plays its part in but a small number of diseases. The horizon, however, is still extending, for now we look beyond preventive medicine, which is a negative attitude, to positive health, and this is shown by the growth of what is known by medical people as social medicine. It is the aim of social medicine to provide conditions whereby people may enjoy the fullness of life. It is a positive outlook and we can apply it to animals, for it should be our object to advise the agriculturist so that his animals may be in excellent health and condition, providing him and the community which he serves with the food and other necessities which become so paramount when a world war causes an acute shortage. There are thus two points which I wish to make:—

(1) Diseases are seldom due to one specific cause, but more frequently arise from an upset in the equilibrium which an animal has established with its environment.

(2) Our main objective is not the curing or preventing of disease, but to advise the farming community so that healthy stock is the rule and disease only an unfortunate incident.

Domestication of animals has brought its problems and as far as calves are concerned we know that death sometimes takes a heavy toll. At least 6 per cent. of calves born alive in the North and North-Western agricultural divisions of England die before they are six months of age. If we accept the pre-war estimate that there are in this area approximately 950,000 cows in milk, cows in calf and heifers in calf, and assume that about 750,000 calves are born per year, then a death-rate of 6 per cent. means an annual loss of 45,000 calves in this area. (The Northern agricultural division comprises the counties of Northumberland, Durham, and the North and West Riding of Yorkshire; the North-Western agricultural division comprises the counties of Cumberland, Westmorland, Lancashire, Cheshire, Derbyshire and Staffordshire.) Estimates made by similar methods show that the county of Cumberland has a loss of 3,500 calves per year, Northumberland a loss of 2,000, and Westmorland a loss of 1,100. I have no comparable figures for any particular area in Scotland, although a calf mortality of 11·4 per cent. was experienced in 1936-37 in 47 herds, of which 34 were in the Ayrshire district; 12 around Edinburgh and one in Perthshire.

There is no call for complacency about these figures, which are based on a survey made a year or so before the outbreak of war. (Lovell and Hill. (1940.) *J. Dairy Res.* **11**. 225.)

What are the diseases which are responsible for deaths in calves? They comprise intestinal disorders such as white scours and infection with Salmonella organisms, pneumonia of varying aetiology, calf diphtheria and lead poisoning. Other diseases may not kill but lead to restricted growth and of these one may cite nutritional disturbances such as rickets.

WHITE SCOURS is probably the commonest disease of young calves and the bacteria associated with it are usually *Bact. coli* which are normal inhabitants of the intestines of man and animals. The different types of *Bact. coli* vary in their virulence and under some circumstances produce disease and death. A special race of *Bact. coli* may become virulent by producing disease in weakly calves and thereafter this strain attacks stronger calves. The predisposing causes of white scours are often associated with errors in diet which enable the bacteria to invade the tissues, for typical white scours is a septicaemia resulting from an upset in the balance between the animal host and the bacteria present in the intestines. The digestive tract of the newborn calf is easily disturbed especially by over-feeding and when fed "on the bucket" calves take in large quantities of milk at one time and abnormal curd formation in the fourth stomach may result. Lack of colostrum as well as digestive disturbances may lead to an increase in the intestinal bacterial flora and the invasion of the tissues depends partly on this increase, partly on the virulence of any special race of *Bact. coli*, and probably also on other factors of which we are ignorant.

The prevention of white scours is bound up very closely with the methods of calf husbandry and the giving of colostrum. Calves which have to be separated from the dam at birth may be given two or three pints of serum taken from the mother or another cow in the neighbourhood in the place of colostrum. The way in which colostrum acts is probably complex although it is known that antibodies against prevalent strains of *Bact. coli* are present in the colostrum and serum of normal cows and that the antibody content of colostrum is higher than that of the serum. Furthermore, the calf's intestine is permeable to these antibodies for the first two days of its life. Some association between a low content of vitamin A in the colostrum and white scours is said to exist although feeding cows during pregnancy with cod-liver oil and feeding similar substances to calves have not influenced the course of events. In spite of this the greater mortality in spring calves is possibly associated with the lack of grass feed available for the pregnant cows during the preceding winter months. Other factors and other vitamins may be important and some cases of white scours have been controlled by the giving of shark-liver oil and nicotinic acid. Finally, milk should be withheld from calves suffering from the disease and water followed by diluted milk should be given instead.

Salmonella dublin infection attacks older calves and the cattle are the chief reservoir of infection. This organism may produce a blood-stained diarrhoea, and a septicaemia with pneumonia may develop. Sporadic cases and outbreaks have occurred in Great Britain and carrier cows are known to exist.

PNEUMONIA OF CALVES has a varying aetiology and is often associated with fatigue after prolonged transit. *Actinobacillus actinoides* has been stated to be a primary cause of many cases of pneumonia in calves, and the picture is often complicated by *C. pyogenes*, pasteurella and haemolytic cocco-bacilli developing in lungs which are already damaged. Whether the filtrable agents described within recent years as causes of calf pneumonia bear any relationship to *Actinobacillus actinoides* is an open question. *C. pyogenes* and this haemolytic cocco-bacillus have been recovered from normal animals but they have a considerable share in the

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disease process and one or both species may be present. *C. pyogenes* induces the formation of areas of greenish pus within the dark red solid portions of the lung; a fibrinous pleurisy frequently accompanies this picture. The pneumonia associated with the haemolytic cocco-bacillus shows solid areas from which small beads of pus are expressed when a cut surface is squeezed. *Pasteurella septica* has also been recovered from cases of pneumonia in calves in this country and in this form there is an associated pericarditis and cases are acute and usually sporadic.

Various therapeutic remedies have been tried in cases of calf pneumonia and two of the more popular ones are sulphapyridine and *C. pyogenes* antitoxin.

Lead poisoning in calves is usually acute and the calf is found dead. Calves will chew and lick anything within reach and the source of the lead is frequently paint which is old, faded and flaking. The paint which was used on doors and window frames years before the war is now in that state and although a large dose may produce death within a few hours, small doses may be cumulative and symptoms appear quite suddenly. They consist of blindness, bellowing, great excitement and attempts to climb walls. No very obvious lesions may be seen *post mortem* but blackened flakes of paint are sometimes found in the stomach contents and a simple test for lead may be made.

Although treatment of acute lead poisoning is unlikely to be of much value, magnesium sulphate and sodium citrate have been tried. Small doses of potassium iodide have been given in subacute cases.

Rickets is essentially a disease of young animals and is characterised by failure of the bones to calcify normally. Cartilage continues to be produced at the epiphysis and this region becomes wider and bulges. There is thus enlargement of joints, a tendency for the long bones to be curved and the result is a typical stilted walk. The symptoms which precede are a diminished appetite, digestive disturbances and a certain amount of tetany. The causes are associated with inadequate vitamin D and a faulty proportion or insufficient amounts of calcium and phosphorus. Treatment is aimed at adjusting this balance or supplying the deficiency. Daily exposure to the sun during the summer provides calves with adequate vitamin D, but an extra supply in the form of cod-liver oil is recommended if roughage of low quality is fed and calves are kept indoors for long periods.

What advice, then, are we to give the farming community in order that calves may live in good healthy conditions? It is of course obvious that suckling, being the natural way, is the best method of calf rearing. Economic considerations often rule this out and pail feeding is resorted to. Some attempts are being made to stop the premature slaughter of calves suitable for beef by suckling a number on to nurse-cows. The cows are housed and tied in the shed and the calves are turned on to them twice daily for suckling. Each calf is fed in this manner for about nine weeks before going out to grass and each cow rears about 12 calves per year. Losses among the stock appear to be negligible.

Where pail feeding must be resorted to then it must be impressed upon owners and attendants that attention to detail is essential. Feeding must be carried out regularly and it is better to feed three or four times daily in smaller quantities than twice daily with larger amounts. Any changes which are made in the diet must be made gradually, for like all young stock calves are creatures of habit and object to sudden and drastic changes. If calf mortality is to be reduced, then more attention must be paid to the calves; they must not be considered merely as incidental to milk production.

Finally, the mother must be considered too. If cows are asked to produce quantities of milk far in excess of what is normal and are expected to nourish a foetus at the same time, then they must be fed and housed accordingly. To reap what we have sown applies to herds as well as to crops.

Discussion by North of England Division, N.V.M.A.

The discussion was opened by the President, Mr. J. P. Pickering, and the Hon. Secretary, Mr. W. Lyle Stewart.

Mr. J. P. Pickering, after expressing thanks to Dr. Lovell, said: It has constantly been a matter of conjecture in my mind whether the opener of a discussion on a paper should confine himself to an analysis of that paper or should strike out on a line of his own. I propose to adopt the latter course and to approach the matter from a purely practical aspect.

Calf Husbandry.—I do not think that anyone will disagree with me if I say that the most important aspect of calf diseases is that of prevention, and there is no doubt that the two most important factors in this connection are hygiene and dietetics. With regard to hygiene, the essentials are warmth, together with adequate ventilation, proper drainage of calf pens and cleanliness of feeding utensils. I believe the best way to rear calves is to house each separately; to supply bedding liberally on a floor which has a very marked slope for drainage. If this latter point is as good as it should be I consider that it is not necessary or even advisable to clean out the pens frequently. I have too frequently seen outbreaks of calf pneumonia follow a "mucking out" of calf hutches and the immediate replacement of the calves.

For many years I have been deeply interested in the subject of calf dietetics and the factor which has been most forcibly impressed on me by way of practical observation is that more calves are harmed by overfeeding than by underfeeding. This is well exemplified by a reference to the suggestions made by Professor Williams of New York, who learnt by experience and practised what he preached. His recommendation was that calf remained with dam for 24 hours and that for the first week of its life a calf should be given 1 pint each milk and lime water twice a day with the addition to the first feed of 4 oz. of castor oil.

The chief diseases of calves are, in my experience, white scour and calf pneumonia. In practice, I treat the former with coli-serum—with variable success depending, I do believe, on whether one is really dealing with infectious white scour or merely with a gastro-enteritis brought on by bad dietetics. This is borne out by the fact that the more acute or more infectious the trouble the better the result from serum treatment. In calf pneumonia sulphapyridine is the standby and again gives excellent results provided the disease is not a sequence of ill-drained calf pens. Many cases of joint-ill, too, respond to this drug. I must confess that although I consider myself an able diagnostician I find it very difficult to make a very definite clinical diagnosis in individual sick calves. This is because I find it very difficult to draw up any differential diagnosis in scours and pneumonia. Infectious conditions are simple but sporadic cases are much more difficult. In all cases of sporadic scour I recommend resort to a starvation diet.

I would like to say a word about hoose in calves but do not wish to take up a lot of time. I will, however, say this in full consciousness that I will be attacked on the subject but with complete equanimity because I can point to many thousands of successes and the knowledge—not the belief, nor the thought, nor the opinion but the knowledge—that it does effect a cure. For more than ten years now we have used an intratracheal injection called Injectio Chenopodii (Hewlett) as a cure for this condition and it does effect a cure. I understand that an injection of phenothiazine is being prepared but it will have to be good if it is better than the one I mention.

I may say in passing that at College I was told that a weak solution of Keni in water was advised for intratrachealing for hoose. Full of confidence in my new-found wisdom, when recently qualified I used it on about 15 calves—they all died. This taught me that professors are not always right.

Mr. W. Lyle-Stewart: I cannot lay claim to any very extensive experience of calf diseases, but the subject is one which, sooner or later, confronts every veterinarian, and it is important to bring our knowledge up to date. Just now we are all concerned with the conservation of livestock, and your Council thought that it would be most topical to have an address on this subject, and we have not been disappointed. Dr. Lovell has given us a valuable scientific background to the subject of calf diseases, and we are most fortunate to have had him here this afternoon, knowing that what he tells us will be eminently sound and practical.

I entirely agree with the doctrine which says that very few diseases are caused by a single entity, and its truth is clearly demonstrated in calf diseases. In the scours, for example, there is a good deal of variation from herd to herd as regards manifestation, response to treatment and termination, due no doubt to the varied bacterial flora or even to strain differences within the genus, and one cannot escape the conclusion that many scours are secondary to a debilitated intestinal wall. A useful preventive in many outbreaks is the use of the Wellcome anti-coli serum which is injected soon after birth. Lamb dysentery serum is also reported to be useful, and I wonder whether Dr. Lovell considers this due to a specific or non-specific action. Has the *Cl. welchii* organism been isolated from diseased calves? If not, can he explain why its use seems beneficial in calves? There can be no doubt that calf-rearing is a skilled occupation calling for intelligence and experience. I was once consulted regarding losses in Jersey calves by an owner of a Friesian herd. Death was quite clearly due to acute indigestion following too large a ration of Friesian milk. The Jersey calves were simply killed by too much milk and the bacteria isolated played a minor role. The trouble completely subsided when the Jersey calves had their ration reduced by two-thirds. Another form of troublesome scour occurred in a beef herd. All the calves born indoors contracted scour after a few weeks which, although non-fatal, greatly interfered with their condition and liveweight gains. All treatments tried were ineffective. The effects of both reducing and increasing the cows' rations were tried, but without effect. Curiously enough, the trouble all but disappeared when water bowls were supplied to each cow. Some of these calves can now take the milk of two cows without any bad effect. I would like to ask Dr. Lovell more precisely what system of calf-rearing he has found most successful in a commercial, self-contained herd where milk is an important consideration. I like Mansfield's system of rearing eight or ten calves by suckling on a really good cow, but this demands good accommodation, is somewhat laborious and, of course, interferes with milk-recording. Calves so reared, however, are said to thrive and develop amazingly well and suffer less from the setbacks suffered by calves reared on a less natural system. The folly of using diseased cows for this purpose is, of course, obvious.

I have had a good deal of experience of *C. pyogenes* infection both in cows, calves and sheep, and have good reason to regard this as a very common secondary invader, and I note Dr. Lovell does not regard this as frequent primary cause of pneumonia. Could Dr. Lovell tell us what results have been obtained from the use of *C. pyogenes* antitoxin?

I am glad the essayist mentioned lead poisoning. I think this is much commoner than generally supposed, and in one outbreak seen recently I was very surprised to learn what a small quantity of lead paint it took to induce symptoms and death. Any painted woodwork is very much to be suspected and an important point—stressed by Dr. Lovell—is the latent period which can elapse between ingestion of lead and the appearance of symptoms. I should think that lead poisoning is the correct diagnosis in many outbreaks when there is a history of fits, great excitement, pain and sudden death. It is important not only to note where the calves are at the time of illness, but where they have been during the previous two weeks.

I was interested in Dr. Lovell's remarks on social medicine. Reference to such things at this election period may be regarded as tactless, but I cannot withhold the observation that before we can act effectively as advisers in animal husbandry we need a much freer and more frequent entry to a farmer's premises. We should be able to go when it is necessary to go, instead of waiting until the farmer calls us. With all its faults and failings that is one great point in favour of the present veterinary panel scheme because by providing more frequent entry we can more often advise on management for positive health.

General Discussion

Mr. T. M. Mitchell expressed appreciation of the address. He would like to correct the conception that lead poisoning did not occur in his practice. Actually, he thought that it did but he had to confess that he had never been able to diagnose it definitely. He disagreed with the President's remarks on the idle calf pens. He thought that some of the best calves were reared on muck to which plenty of straw is added. He referred to calves which on *post-mortem* examination showed large clots of gluey tenacious material, sometimes as large as a football. He would like to ask the lecturer if clots of this size could be dissolved with sodium citrate. As he was not familiar with the details of Mansfield's system of calf-rearing, he would be grateful for further particulars. Mr. K. A. Forker said he also was reared in the bacteriological age but he had been forced to abandon the theory as it failed to account for many of the manifestations of disease. He had noted that many farmers preferred to keep their calves in dark, ill-ventilated hovels. They appeared to be afraid of exposing them to sunlight. He was most surprised

that Mr. Mitchell preferred rearing on dung and Mr. Forker deplored this system, which he regarded as a very backward one. He stressed the importance of regularity in calf feeding. It was quite true that certain markets had a bad reputation for spreading calf diseases, particularly scours, and he would like to ask the lecturer about the viability of the common organisms associated with scour. Observations would seem to suggest that they can live from one week to another. If calves sucked each other, did the lecturer consider this to be dangerous or was the trouble with these mart sold calves merely one of long transit under bad and wet conditions? Mr. G. M. G. Oliver asked the lecturer whether calves which are starved of milk as youngsters were slow to come into season. Did he recommend the feeding of lime water with milk in the case of bucket-fed calves? He himself frequently recommended the addition of a third of lime water. With regard to Mr. Lyle-Stewart's points about not nursing calves on a diseased cow, he pointed out that it is quite common to put calves on to a cow which had had mastitis. Would calves reared on a mastitis affected cow be likely to become affected with the disease or, on the other hand, would it tend to immunise the calves against mastitis? Mr. J. D. Peele said that in practice one commonly saw two types of calf-scours. First of all there was the white scours attacking young calves and, secondly, another type of scours attacking calves over two months. He agreed that markets were a common source for disseminating calf diseases but he was rather of the opinion that calf scour was not an infectious disease. Mr. Boyd asked if Dr. Lovell had any information regarding the use of sulphaguanidine in the treatment of calf scours. Mr. J. A. Powley, contributing to the discussion, wondered whether or not some of the sudden deaths in young calves referred to by Mr. Lyle-Stewart were not due to a vitamin deficiency. He had seen young pigs die very quickly from trouble associated with a deficiency of vitamins A & B. He said that he had come across a cow in a herd in Yorkshire which was excreting *S. dublin* in the faeces. Pure cultures of this organism were regularly obtained and the animal could only be looked upon as a factory for this rather dangerous micro-organism.

Mr. T. B. Elphick asked the lecturer if he had any information regarding the incidence of internal parasites in calves. At what age do calves become liable to parasitic disease? He referred to cases resembling "lumpy jaw" in calves which seemed to be infectious. Treatment with potassium iodide appeared to bring about recovery. Recently a bull placed in a stall previously occupied by calves showing these jaw lumps developed the disease two weeks later. With regard to ringworm in calves, had Dr. Lovell any method of dealing with this troublesome disease which frequently occurs in rather virulent outbreaks. How should one eradicate ringworm? With regard to husk in calves, he did not think that intratracheal injection was the right method of dealing with the disease. Even although these injections cured calves they suffered from a considerable setback and he thought it much better to pay more attention to mixed grazing with other stock as a preventive measure. Mr. Edwards referred to an outbreak of white scour in calves which was cleared up following the simple expedient of tying the calves' navels soon after birth. On that same farm he allowed six bull calves to go one day without tying and all six of these calves died later from white scour. With regard to lead poisoning, he was inclined to agree with Mr. Lyle-Stewart in thinking that this disease is much commoner than we think, and also that it can be caused by very small amounts of lead. In an outbreak he investigated chemical analysis disclosed the presence of 1/400 part of a grain of lead per gramme of faeces examined.

The Reply

Dr. R. Lovell, in replying to the discussion, first of all thanked the members for the spirited way in which they had discussed his paper. He would try to answer as many of the questions as possible, but must reiterate that the crux of the matter lay in calf husbandry. He had chosen the age of six months as to the meaning of a calf and his paper and the figures therein referred to calves up to the age of six months. Consequently, he did not include hoose because he was reliably informed that hoose is not common in calves below the age of six months. Mr. Lyle-Stewart had reported good results from the use of coli antiserum but he would doubt very much whether this was due to any specific anti-bacterial action. Although the common types of *Cl. welchii* are present in the intestines of calves and a fresh type had been recorded by Bosworth, this would not explain the reason why lamb dysentery serum had been observed to be effective in the treatment of some cases of white scour, and it required further elucidation. He was unable to give any reason why the addition of water bowls to the cows should have an effect in reducing scour. He would repeat that one could not lay down any definite hard and fast rules about calf rearing, but rather one should be guided by general principles. Feeding, in his opinion, was more important than housing, and he really could not see why the system of calf rearing by nurse cows should not be more widely adopted; at any rate it was worth consideration. He agreed with Mr. Lyle-Stewart that *C. pyogenes* was frequently a secondary invader but it probably killed calves. The results from antitoxin treatment had been reported as good, but he did not think that the trials had been very extensive. The quantity of lead needed to cause death in calves was probably very small. Concerning social medicine, he would like to point out to Mr. Lyle Stewart that this was quite different from socialised medicine. In reply to Mr. Mitchell, he was unable to say how long these black flakes of paint might remain in the stomach but it was always worth while taking some of the stomach contents on a tray and looking for the blackened flakes. He was of opinion that large gluey clots in the stomach could to some extent at least be broken down by sodium citrate for this could be done *in vitro*. It was not uncommon for cows to rear 12 calves per year and naturally these calves were not all put to the cow at once, but generally went to the cow in pairs or in threes. The batches of calves could suckle a cow for nine weeks and counting five periods of nine weeks each it was quite clear that the cow could rear something like 10 to 15 calves per year. With regard to disinfection of calf pens, he would point out that *B. coli* is not difficult to kill, but he thought that the exposure during long transit, perhaps in wet weather, and lack of food, was more important in inducing calf troubles than any infection they might pick up at the market. He understood that linseed should be made up either with cold water or very hot water and this could be prepared the day before use. Lime water is considered quite good in scours, probably not so much because it was lime water as because it diluted the milk and plain water would probably be as good. He agreed with the speaker who said that more damage is caused by over-feeding than under-feeding calves. He would not recommend nursing calves on cows affected with mastitis. At one time it was considered that freshly calved heifers were free from mastitis, but now they knew that infection may be present in such animals and he considered it rather dangerous to nurse calves on a mastitis cow. Scours in calves over two months old might be due to *S. dublin*, which was commoner in older calves, and the faeces were often blood stained. Ordinary calf scours appeared to be infectious up to a point, but the virulence of the organisms was very variable and may be enhanced and thus able to affect the stronger animals. A good deal depended upon this virulence, which was by no means fixed, and this was one of the reasons why the science of bacteriology could never provide the complete solution to calf diseases. He understood that the best preventive for hoose was to keep young cattle off damp pastures but did not think that parasitic diseases were important in calves under six months. The causes of the lumpy condition in the jaws of calves could be settled by an examination of pus from the lesion. Ringworm was troublesome and he really did not know what one might best do to eradicate it, but he thought that sunlight and good housing conditions would probably help in its prevention. Mr. Edwards' remarks on the mode of infection by *B. coli* were interesting. Generally it was considered that this infection was through the mouth and not through the navel and in experiments carried out many years ago in Ireland the tying of the navels did not reduce the incidence of calf scours.

Dr. Lovell again thanked the members for receiving his remarks so kindly and for a very pleasant visit.

Discussion by Dumfries and Galloway Division, N.V.M.A.

Mr. A. J. Kennedy opened the discussion by enquiring what would be the *post-mortem* findings in calves dead of lead poisoning.

Dr. Watts expressed his appreciation of the paper, and mentioned losses among calves apparently from a Pasteurella infection. There were, however, no pneumonia lesions. He would like an opinion as to the cause of the sudden cessation of deaths encountered in white scour outbreaks. He described cases of lead poisoning in which the calves had no apparent contact with any source of lead. He suggested as a possible source the heating of milk by running in steam through copper pipe with lead joints.

Mr. J. Barr thanked Dr. Lovell for his paper and noted the emphasis placed on husbandry in the prevention of calf disease. He was interested in the feeding of serum in place of colostrum, and inquired how much blood would be required and how it should be fed.

Mr. T. B. Fleming enquired if, in Dr. Lovell's opinion, all calves were born healthy or if there was a possibility of intra-uterine infection.

Mr. A. Hector referred to the method of calf feeding advocated by Professor W. L. Williams, and enquired whether it was in common use in this country.

Mr. A. Young said that he had observed a great increase in the number of cases of joint-ill in calves. He found that many calves died of septicaemia on their third day of life and that scour did not usually appear until the seventh day. Calves which survived an attack of scour usually took pneumonia at about one month old. He used an oral vaccine for the prevention of these conditions with great success.

Mr. D. I. McAllister implemented the remarks made by Dr. Watts and mentioned pericarditis as a common *post-mortem* finding. He claimed success for sulphapyidrine in treatment. He enquired as to the incidence of parasitic infestation in young calves, mentioning an outbreak in three-month-old calves soon after going out to grass. Several deaths occurred, larvae were found in the faeces, and phenothiazine was successful in effecting a cure. He enquired about the treatment of coccidiosis and of scour caused by Salmonella infection.

Mr. A. J. Kennedy wondered if Dr. Lovell could give any information about the use of cereals as a substitute for milk. He asked Mr. McAllister about the identity of the parasite involved in his outbreak. He emphasised the usefulness of the Gordon-Whitlock slide in egg-counting.

Mr. I. Findlay invited Dr. Lovell to enlarge on calf diphtheria. He mentioned successful treatment of scour with lemon juice and water.

Mr. R. L. Bell commented on an outbreak of scour experienced by him among a group of calves, well fed and kept under good conditions; 12 deaths occurred. There were no special *post-mortem* findings. Bacteriological examination and examination for lead proved negative. On the diet being changed to one of water and poor hay, no further deaths occurred. Could the condition have been due to excess protein?

The Reply

Dr. Lovell: Mr. Kennedy had asked about the *post-mortem* findings in lead poisoning. Very often there were none. Lead could be demonstrated by chemical test or flakes of paint could be found by washing the stomach contents in a shallow tray. In reply to Mr. Kennedy's query about milk substitutes, he had no experience of substances other than milk. He considered the condition described by Dr. Watts to have been septicaemia due to either a Pasteurella or a haemolytic cocco-bacillus. The sudden cessation of deaths in *B. coli* septicaemia outbreaks was probably due to a rapid variation in virulence. He agreed that water could be a source of lead, but could give no information as to the lead content of copper pipes. In reply to Mr. Barr, he considered four to six pints of blood to be equivalent to two to three pints of serum. The Americans gave this as one feed soon after birth. He considered that calves are usually born healthy and that scour infections are post-natal. He was interested to hear Mr. Young speak of an increase in joint-ill. He was not aware that this infection was so common. Possibly it had a patchy distribution. He was interested to hear of the success of oral vaccine as there was a good deal of argument about this type of vaccine. He thought Mr. McAllister would find sulphaguanidine effective against coccidiosis but not against white scour.

Dr. Lovell thought that Mr. Findlay would have less trouble with calf diphtheria in the future, as sulphapyridine worked like a charm in this condition. In the lemon juice and water treatment it was probably the water which was responsible for success. He suggested large doses of sodium citrate to break down abnormal curd formation. He thought that the condition described by Mr. Bell was obviously dietitic in origin, possibly a mineral deficiency.

POULTRY KEEPING EXPANSION "ON SOUND LINES"

Speaking at the opening of the National (Red Cross) Poultry Show, at the Royal Horticultural Hall, Mr. Tom Williams, Minister of Agriculture and Fisheries, said that there was no doubt that we could now look forward to the gradual expansion of poultry keeping, in so far as feeding-stuffs could be made available for the purpose, but it was vital that the expansion should be on sound lines. "Above all it must rest on the methodical building up of high quality pedigree stock. The Government has done what it can to pave the way. Preference in such supplementary feeding-stuffs as were available, over and above the limited basic ration, has from the first been given to the skilled breeder. More recently the administrative machinery at headquarters has been strengthened; poultry matters are now handled by one Division of the Ministry. The Stock Improvement Advisory Committee has been set up, bringing to my aid the best advice that eminent practical members of the industry can give. The accredited breeding schemes have been brought under centralised control, and will be administered and developed by the Ministry in close consultation with this Committee. The poultry advisory service has been established, and will take its place in due course as an integral part of the national advisory service for agriculture under the Ministry's direct control. All this has put the Ministry in a much stronger position to assist the development of the industry in future years, and to enlist the active co-operation of practical poultry breeders and feeders."

Note on a Bacterial Cause of Sterility in the Rabbit*

M. H. KYAW, M.R.C.V.S., PH.D.
School of Agriculture, Cambridge

Material

The observations were made upon individuals of specially bred strains of rabbits kept at the Animal Research Station, Cambridge. It had been noticed by Dr. Hammond and his colleagues that some does became irregular in breeding or went absolutely sterile after a period of regular breeding. Such animals on *post-mortem* examination showed enlarged uteri with the uterine cavity filled with a cheesy, sticky pus. In advanced cases, the enlarged uterus could be palpated and saline vaginal washings were slightly milky due to the presence of pus in the anterior vagina.

Dr. Hammond has kept very complete breeding records and by referring to these it was easy to pick out for examination animals which had been breeding irregularly or had failed to produce a litter over the last few matings. It was also possible to pick out bucks which had given few successful matings.

Technique

A number of animals, both does and bucks, were examined. The first two does, with a known history of sterility, were killed and cultures were made from the uterus and vagina into (*a*) plain broth, (*b*) 1/100,000 brilliant green broth, (*c*) McConkey's broth and also plated on (*d*) 5 per cent. serum agar, (*e*) 1/100,000 brilliant green agar and (*f*) McConkey's blood agar. Other does had their vaginas washed out with ordinary normal saline with an inseminating tube, and the washings put into plain broth, which after six hours' incubation at 37° C. was plated on to serum agar and gentian-violet blood agar plates and in some cases also on to blood agar plates. In the case of the bucks, specially thin cotton-wool swabs like human nasal swabs were used. The buck was held between an assistant's knees with its head down and its ventral side facing the operator. The assistant held the buck's two hind legs apart. The prepuce and the perineal regions were wiped liberally with methylated spirit and the prepuce pulled back as far as it would go, exposing the whole of the penis. The swab was soaked in sterile saline and then the penis and the mucosa of the reflected prepuce were wiped all over with the swab. The swab was then wiped on one side of the plate and then the whole swab was put into a plain broth tube. After that, the plating was completed in the usual manner by means of a platinum loop. Once again, serum agar and gentian-violet blood agar plates were used.

All cultures were examined the next day and the following day. After making sure by the usual methods that pure cultures were obtained, they were identified.

Results

From the great majority of animals, a pleomorphic, Gram-negative, non-motile, cocco-bacillus was isolated. On serum agar plates, the organism formed circular, low convex, moist, slightly opaque colonies which measured up to 3·0 mm. after 48 hours' incubation. The organism fermented sucrose and glucose; the fermentation of maltose and mannitol was variable; lactose and salicin were not fermented, indole was produced, M.R. and V.P. tests were negative, and litmus milk remained unchanged. No gas was produced in any of the sugars. The organism was identified as *Pasteurella septica*.

The second type of organism which is described in the text as "*Br. bronchisepticus*-like organism" was a Gram-negative cocco-bacillus, motile, fermented no sugars, but produced indole and turned litmus milk slightly alkaline. The full results of examination are given in Table I.

An examination of Table I reveals the following facts:—

(1) *P. septica* was recovered from eight out of ten does. From the two remaining does, a strain of *Br. bronchisepticus*-like organism was obtained.

(2) *P. septica* was recovered from all the five bucks examined. One of the bucks yielded a mixture of *P. septica* and a strain of *Br. bronchisepticus*-like organism.

The only other organism which was isolated most frequently alongside the above organisms was *B. coli*.

Thus, there is little doubt that *P. septica* is closely associated with sterility in these rabbits. It is well known that *P. septica* is frequently found as a commensal in the nasal cavities of rabbits. So it is conceivable that this organism may also exist as a commensal in the external genitalia of rabbits. To find out whether *P. septica* does exist as such, four does with regular breeding history were obtained from the Department of Pathology and cultures were made from their vaginas. The results are given in Table II.

Table I
Results of the Examination of Sterile Bucks and Does

Animal	Sex	History	Origin of Material	Primary Organisms	Other Organisms Isolated	Remarks
P4380	F.	Sterile	P.M. material. Uterus and Ant. vagina	*P. septica*		0·5 ml. of an 18 hour culture in serum-broth in 10·3 dilution killed mice in 48 hours when given intra-peritoneally.
C4040	F.	„	„	„		„
C4290	F.	Suspected to be sterile	Vaginal washings	„		
I4896	F.	Possibly sterile	„	*Br. bronchi-septicus* (?)		
C7111	F.	Suspected to be sterile	„	*P. septica*	*B. coli*	
C7085	F.	„	„	*Br. bronchi-septicus* (?)		
C6043	F.	„	„	*P. septica*	*Neisseria*	
			Uterus after death	*P. septica*		
G4551	F.	Sterile	Vaginal washings	*P. septica*		
E4489	F.	„	Uterus after death	*P. septica*		In life only *B. coli* obtained from vaginal washings.
G5030	F.	„	Uterus and Ant. vagina after killing	*P. septica*		
C3481	M.	Suspected to transmit sterility	Penal sheath swabs	*P. septica*		
I4857	M.	„	„	*P. septica*		
C6042	M.	„	„	*P. septica*		
C38081	M.	„	„	*P. septica*	*Br. bronchi-septicus* (?)	
H7227	M.	„	„	*P. septica*	*B. coli*	

Table II
Results of the Examination of Does with Normal Breeding History

Animal	Origin of Material	Primary Organisms	Other Organisms
No. 27	Vaginal washings	Coliform.	
No. 21	„	*Br. bronchisepticus* (?)	
No. 29	„	*B. coli*	
No. 26	„	*B. coli*	*P. septica*

The results reveal that *B. coli* is the usual inhabitant. The recovery of *P. septica* from one of the normal does is interesting. Its significance is discussed later.

Experimental

A few trials were made to reproduce the disease. Three does with known history of regular breeding were taken; all of them had litters two weeks previously. Since the stage of the oestrous cycle might be a factor in determining susceptibility to infection, the first doe was given 100 units of human pregnancy urine extract intravenously four days before experimentation; subcutaneous implantation of a stilboestrol tablet was carried out on the second doe also four days before experimentation, while the third doe was treated like the second except that implantation was done eight days before experimentation. On the day of experimentation, the first two does were operated upon and into the lumen of the right uterine horn of each was injected a *P. septica* culture isolated from the uterus of rabbit C.4040. The culture was grown on plain agar slope for 24 hours and washed out with 1·0 ml. of normal saline and 0·25 ml. of that suspension was injected. In the case of the third doe, all the 1·0 ml. of bacterial suspension in saline was mixed with a freshly collected sample of semen from a normal buck and the mixture artificially inseminated.

Unfortunately, two days later, the first two does died. *Post-mortem* examination showed diffused peritonitis. The third doe was killed 19 days after the insemination. Cultures were made from appropriate organs. Results are shown in Table III.

* This note is published although the work is incomplete, because the author is leaving for Active Service abroad and wishes to put on record observations which may be of some interest to the pathologist and animal breeder.

TABLE III
ISOLATION OF ORGANISMS FROM EXPERIMENTAL DOES

Rabbits	Vagina	L. Uterine Horn	R. Uterine Horn	Heart Blood	Physiological state of the Uterus
No. 1	—	Sterile	Much pus. *P. septica*	Thin Gram −ve rods	Pseudo-pregnant
No. 2	—	Very little pus. *P. septica*	Very little pus. *P. septica*	Thin Gram −ve rods	Oestrous
No. 3	Sterile	Sterile	*P. septica*	—	Oestrous

The above results do not justify any conclusion, but are interesting *per se*. These experiments should be repeated with many more animals and with the uteri in various physiological conditions. However, perhaps it is justifiable to say that *P. septica* could be conveyed into the uterus from the vagina by the spermatozoa and also that when the cervices are relaxed, it is possible for the infection to extend from one horn to the other horn.

Discussion

P. septica and *P. septica*-like organisms are widely distributed both as commensals and parasites in the animal kingdom. Kyaw (1943) reviewed the literature on the *P. septica* infection of animals and man up to that time. Allott, E. N. *et al.* (1944) described the isolation of *P. septica* from cat and dog bite wounds in man. This is the first time that *P. septica* has been observed to be associated with reproductive disorders, and the disease appears to be a true venereal disease.

De Kruif (1921-22) and Webster (1924) have shown that *P. septica* exists even in the nasal cavities of presumably normal rabbits and that these apparently non-virulent organisms could become virulent and initiate serious outbreaks of snuffles in rabbits under favourable conditions. It was learnt from Dr. Hammond that there had been a very serious outbreak of snuffles in his stock some years ago. It is conceivable that since that time the sniffing of the vaginas of does by bucks harbouring these organisms in their nasal chambers might introduce the infection into the genital tract of the does, and the organisms in their virulent state probably became established and adapted to an existence in the genital tract. The pseudopregnant condition of the uterus with its secretions apparently favours the establishment of the organisms. Normal bucks which served these infected does probably got infected themselves and propagated the disease.

The disease is a chronic one, as clinical observations bear out. The fact that *P. septica* was recovered from a normal doe with regular breeding history up to the time of observation lends this conclusion some support. It would be interesting to know if this doe eventually becomes sterile. It is reasonable to assume that reproductive disorders associated with *P. septica* amongst rabbits must be fairly common. It would be of great interest to find out if the genital tract proper of the bucks harbours the organisms; and if so, how this may affect fertility and the spermatozoa.

Acknowledgments.—The writer is indebted to Dr. J. Hammond, F.R.S., for the material, and to Dr. A. Walton for suggesting this work. To Professor H. R. Dean gratitude is due for permission to work in the Department of Pathology. To the Agricultural Research Council the author is indebted for a grant. J. Hammond, jun., kindy co-operated in performing the experiments.

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Weekly Wisdom

"*. . . it is one thing to have a feeling of conviction and quite another to have an intellectual certainty.*"—Dr. WILLIAM BROWN. (1944.) Psychology and Psychotherapy (Arnold).

* * * * *

"Brucellosis is becoming more prevalent. The incidence of this disease is now from 1 to 3 per cent. in swine going to slaughter. If brucellosis is discovered in commercial breedings herds the entire breeding stock should be sent to slaughter."—A.V.M.A. Committee on Diseases of Swine.

CLINICAL COMMUNICATIONS

Hypocalcaemia in the Mare

I—By H. FORSYTH, M.R.C.V.S.
ELVET WATERSIDE, DURHAM

Subject.—A ten-year-old skewbald light draught mare.

History.—The owner telephoned to say that the mare had lockjaw. She had foaled four months previously and the foal had now been weaned two days.

Symptoms.—8.9.45.—When led forward for examination the mare was walking normally. Trismus was present and the mouth was dry to the touch. Attempts to cause the membrana nictitans to move across the eye-ball were unsuccessful. Pronounced spasms of the diaphragm were present, each spasm coinciding with a heart-beat. Pulse and respirations were of normal frequency. Peristalsis was sluggish and the rectal mucosa, dry and sticky, clung to the arm. Defaecation and urination were in abeyance, though the urinary bladder was not distended.

Diagnosis.—None was attempted, but it was thought that the diaphragmatic spasms and trismus might be originating from a gastric derangement.

Treatment.—A pint of linseed oil was given, followed by powders containing nux vomica, ammonium carbonate, gentian and magnesium sulphate.

9.9.45.—At 9 a.m. the owner rang up to say that the mare was much worse.

Symptoms.—Respirations were now very laboured and the pharyngeal muscles so tightly contracted that a stomach tube could not be introduced into the oesophagus. The sterno-cephalic and adjacent muscles were extremely hard to the touch. The temperature was still normal, but the heart-beats were rapid and irregular. The diaphragmatic spasms had disappeared and the mare had staled, but had not passed any dung. The animal was disinclined to move, and, when led, walked rather stiffly. No further treatment was given.

3.30 *p.m.*—In addition to the above-mentioned symptoms the mare was staggering badly and did not flex her hocks. Her actions resembled those of a cow about to go down with milk fever. The respirations were now extremely laboured with stertorous and the heart-beats wild. The temperature was 100° F.

Diagnosis.—Hypocalcaemia.

Treatment.—Intravenous injection of a standard solution of calcium borogluconate.

Course.—While the injection was being given the breathing became easier and the staggering less marked.

10.9.45.—10 *a.m.*—The mare was in very good spirits, grazing heartily and able to trot normally round the field. The owner was advised to milk her lightly twice a day for three days, then once daily for three more days and to use treacle applications to the udder to assist in the drying-off process.

REMARKS.—From the dramatic response to calcium borogluconate, coupled with the knowledge that the owner had been completely stripping the udder for two days previous to the onset of symptoms, it is felt that this is an unusual case of milk fever in a mare.

II—By E. J. HODGKINSON, M.R.C.V.S.
LEEK, STAFFS

Subject.—Shire mare, aged ten years.

History.—The mare foaled successfully in May, 1945, and suckled her foal well. The foal was sold at the annual foal sale on October 2nd, 1945. On her return from the sale, the mare was housed in a loose-box for the night.

On October 3rd, at 7 a.m., the owner found the mare down and unable to get up.

Symptoms.—When examined at 7.30 a.m. her temperature was normal, pulse and respiration were accelerated, and she was sweating profusely. She rose with difficulty, staggered, reeled, soon went down again, and began "chewing" the bedding. She drank a little water with some difficulty.

The protrusion of the nictitating membrane characteristic of tetanus was absent.

The udder was much enlarged, with milk running freely from it.

Diagnosis.—The symptoms being identical with those of milk fever in the cow, a diagnosis was made in accordance with these findings.

Treatment.—A subcutaneous injection of 3½ oz. of calcium borogluconate in water was given. Half an hour later the mare got up and appeared much better. She voided large quantities of urine.

When seen two hours later she was eating well and her gait was normal.

Remarks.—This case seemed unusual in that the condition developed at the end of the lactation period, instead of just after foaling, as would be expected. It confirms the view that calcium therapy is efficacious in such cases.

ABSTRACTS

[Prognostic Value of Blood Determinations in Certain Surgical Conditions of the Horse. Conner, G. H. (1945.) *Amer. J. vet. Res.* **6**. 45.]

Examinations (haemoglobin estimation, red and white cell counts, differential counts) were made of the blood of normal horses and of horses affected with certain surgical conditions (mainly "fistulous withers" and "quittor"). The neutrophil leucocytes were classified according to their nuclear configuration as immature (juvenile and non-segmented) or mature (segmented) neutrophils, the ratio of the numbers of immature to mature being expressed by the Schilling index. The various results were recorded on charts (haemograms), and the variations of the Schilling index were indicated on these charts by a red line ("shiftograph") for easy reference. While the leucocyte response of the animal in the various surgical cases was found to be partly indicated by variations in the white cell count, better information was found to be given by the Schilling index "shiftograph." A rising leucocyte count with a rising Schilling index (an increase in proportion of immature cells) indicated abscess formation or other irritation, and was an unfavourable sign, unless both values decreased fairly soon after reaching a moderate peak. If the Schilling index rose, without a corresponding rise in the white cell count, a guarded or unfavourable prognosis could be given, while an increased leucocyte count with a gradually decreasing Schilling index was generally favourable, indicating good powers of resistance. These points were illustrated in several cases, and in some the changes in the haemogram gave warning of changes in the clinical picture before they actually occurred.

The author recognises the limitations of his investigations, but, when based on frequent blood examinations, the haemograms did seem to provide a reliable basis for prognosis.

E. C.

* * * * *

[Pattern of Fluctuations in Numbers of Trichomonas foetus occurring in the Bovine Vagina during Initial Infections: (I) Correlation with Time of Exposure and with Subsequent Oestral Cycles; (II) Application in Diagnosis. Bartlett, D. E., and Hammond, D. M. (1935.) *Amer. J. vet. Res.* **6**. 84-95.]

Daily vaginal sampling of six heifers and one cow in which initial *Trichomonas foetus* infections had been induced by coitus appeared to show that the disease is characterised by rhythmic fluctuations of the Trichomonas population in the vagina. There occurred certain predictable periods during which the organisms were present in large numbers and these alternated with periods during which the organisms were absent or reduced in numbers.

The parasites were first found in vaginal samples between the sixth and eleventh days after coital infection. The numbers continued to increase until between the 12th to 19th days. Towards the end of the third week a marked decrease occurred but the parasites did not completely disappear in any case up to the first day of return to oestrum. On an average, oestrum occurred about 25 days after the infecting service. At or after oestrum, vaginal samples were negative and remained so until from three to seven days before the next oestrum, when large numbers of parasites suddenly reappeared. This fluctuation in the appearance and disappearance of parasites continued through two to four oestral cycles, the last positive sample having been obtained 126 days after the service resulting in infection.

The authors explain this periodic appearance of parasites in vaginal samples as follows. First of all there is a short-lived infection of the vagina, with or without a concomitant infection of the uterus, during which rapid multiplication of the parasite occurs. During this period of two or three weeks a resistance of the vagina is induced, at the end of which the organ no longer supports multiplication. The subsequent periodic appearance of the parasite in vaginal samples is probably due to periodic discharge into the resistant vagina of material from an infected uterus. Preceding each oestrum the organisms make their appearance in the vagina suddenly and in large numbers—there is no slow rise in the population to suggest multiplication in the vagina—probably due to physiological changes in the cervix and uterus which favour this discharge. It is possible that in extreme cases of pyometra, other factors, *e.g.*, sudden pressure on the uterus during defaecation, movement, etc., may cause a similar release of uterine contents. Whether or not any fluctuation occurs in the numbers and activity of *Trich. foetus* in the uterus requires further investigation.

In view of these findings, it is pointed out that for the diagnosis of bovine trichomoniasis, the animals most likely to harbour organisms are females experiencing initial infections, particularly those known to have been bred to a suspected bull. Such animals should be examined 12 to 19 days *post coitus* or a few days preceding the anticipated subsequent two or three oestral periods.

G. D

[Hormonal Stimulation of Oestrus and Ovulation in Sheep and Goats (A Review). Phillips, R. W., Fraps, R. M., and Frank, A. H. (1945.) *Amer. J. vet. Res.* **6**. 165-179.]

The possibility of stimulating oestrus and ovulation in anoestrous ewes and does with hormones has received considerable attention in recent years. Results have been variable, and techniques that give dependable and satisfactory results in practice have not yet been developed. The authors present a review of the work conducted to date, covering some 72 papers, and attempt to determine the present status of the problem.

The results of the many attempts to induce oestrus and ovulation in anoestrous sheep and goats by the use of gonadotrophic hormones are summarised by the authors as follows:—

(1) Follicular growth and ovulation can be induced in a high percentage of animals injected with gonadotrophins.

(2) Induction of oestrus in conjunction with ovulation, as a result of treatments with gonadotrophins, has been quite erratic, and no satisfactory explanation of the variable results has been found.

(3) Fertility, as measured by percentage of conceptions, is generally lower in animals in which oestrus has been induced or in those force-mated after induction of ovulation than in animals bred during natural oestrus. Satisfactory fertility has been reported, however, in some cases.

Oestrogens, used either alone or with gonadotrophins, have given variable results when given to anoestrous ewes. Results of trials with gonadotrophins and/or oestrogens during the natural breeding season have also been quite variable.

The variable results reported by different workers are difficult to explain. The present authors do not consider that differences in the identity of the hormone preparations used account in any large measure for the inconstancy of oestrus response in ewes and does. Constitutional and environmental factors may play a considerable part in determining the response to specific hormone treatments. These factors, if they do play an important part, are easily overcome in the induction of follicular growth and ovulation. The extent to which they influence expression of oestrus is not clear and cannot be fully understood until the mechanism of oestrus is determined.

The authors conclude that from work with laboratory animals, and the results with sheep and goats, it seems certain that time sequences in hormonal action are critically involved in the expression of normal and induced oestrus. There is obvious need for further work to determine (1) the endocrine physiology of normal and experimentally induced oestrus, and (2) the specific doses and time sequences of hormones that will induce oestrus and ovulation in anoestrous animals.

N. I. S.

Horses Used for Agricultural Purposes in England and Wales.—The Agricultural returns for June 4th now issued by the Ministry of Agriculture indicate the following:—

	June 3rd 1944	June 4th 1945 (Provisional)
Horses used for agricultural purposes (including mares kept for breeding) ...	485 000	463,000
Unbroken horses one year old and over	74,000	73,000
Light horses under one year old ...	8,000	8,000
Heavy horses under one year old ...	23,000	21,000
Stallions being used for service	3,000	2,400
All other horses (not entered above) ...	115,000	114,000
	708,000	681,400

In 1939 the figures indicated a grand total of 846,000 horses.

* * * * *

SWINE INFLUENZA VACCINATION

In a study of the antibody response of swine to vaccination with inactivated swine influenza virus, vaccines were used which had been inactivated with formalin or with ultra-violet light. It was learned that antibody titre was related to dose, but the response was not directly proportional. The response to a single injection was short-lived, but when the animal was revaccinated in four to six weeks a much higher titre was obtained and the decline was much slower. The titre attained and the total amount of antibody produced were increased as the interval between vaccinations was lengthened, and repeated small doses were much more effective than one large dose. Four weeks was considered the best interval between first and second injections.

A high degree of concentration and partial purification of influenza virus can be obtained by ultra-centrifugation of the chorio-allantoic fluid of virus-infected chicken embryos. Procedures have been devised for practical large-scale production of virus for the preparation of vaccine.—(*Science*, May 25th, 1945.)

REVIEW

[Rabbits' Ailments: A Short Treatise on the Domestic Rabbit in Health and Disease. (W. P. Blount, ph.d. (edin.), f.r.c.v.s.) Published by *Fur and Feather*, Idle, Bradford; 1945. Price 3s. 6d., post free.]

It was with the feeling that it should fill a long-felt want in rabbit literature that this new book on rabbit ailments was received, and the greater, therefore, our disappointment in finding that to us it would seem to fall between two stools, being in many parts too technical for the layman while the text and manner of writing is too elementary for the professional reader.

The section on the rabbit in health is both interesting and helpful, including as it does some essential physiological information. The writer makes a welcome addition to the controversial subject of coprophagy by advancing an acceptable and eminently practical theory of his own.

One could have hoped, perhaps, for a better ordered sequence in this section and we cannot help feeling that the table given in the section on birth weights must be confusing to the layman since the metric and avoirdupois weights are both used.

The section on disease produces even more controversial matter and it is fortunate that the author warns us in the preface that opinions expressed are purely his own, since many statements made conflict considerably with accepted views on certain rabbit diseases. Controversial statements are so numerous that it is possible only to mention some of the more striking, *e.g.*, "It should be noted, however, that diarrhoea is not a sign of coccidiosis involving either the liver or small intestines." The statement that pituitrin may be used with confidence in dystocia would seem to us inadvisable in a text-book deemed suitable for the layman; it seems unnecessary to include in such a book paragraphs on diseases not encountered in rabbits in this country, *e.g.*, tularaemia, which in our view can only serve to confuse the non-professional reader.

The style is, in parts, exasperating to the scientific reader, being plentifully bespattered by exclamation marks, giving to the whole an air of facetiousness.

It is with regret, therefore, that we find ourselves unable wholeheartedly to recommend this book to the professional reader, whilst feeling that in many respects it is unsuitable and possibly even misleading to the lay rabbit-keeper.

QUESTIONS IN PARLIAMENT

Bulls (Licensing)

Sir John Barlow asked the Minister of Agriculture if he is aware that the present bull licensing regulations preclude the issue of a dairy bull licence in respect of a bull whose immediate female ancestors, although of outstanding merit and with milk records recognised in other countries, were not recorded for milk production in England and Wales; and if he will amend the Regulations to overcome this anomalous position.

Mr. T. Williams: I am aware that the present Regulations debar some bulls of merit, whose dams, or sires' dams, have been recorded under Scottish or overseas milk recording schemes and not under an official scheme operating in England and Wales, from being made the subject of a dairy bull licence. I am considering what steps might be taken to enable reliable and properly authenticated milk records, other than those prescribed in the Regulations, to be accepted for bull licensing purposes.

Sir J. Barlow: Will the Minister make the Regulations retrospective?

Mr. Williams: I do not think that would be possible.

ANIMAL NUTRITIONAL DEFICIENCIES IN THE U.S.A.

"Nearly every section of the United States possesses soil peculiarities which cause one or more nutritional deficiencies in animals in certain areas of those localities," states the A.V.M.A. Committee on Nutrition, and proceeds: "Soil fertility, rainfall, erosion, leaching, climatic conditions and soil composition are all vitally concerned in profitable animal production and feeding. The swine belt, cattle country, milk sheds, etc., were not arrived at by accident, but have grown up partly because of nutritional facilities present in these particular sections."

The committee reported that there has been a sharp increase in nutritional deficiencies in livestock raising of recent years and that the present livestock feed shortages in some areas are not so much a result of lack of sufficient feed, as to war-time transportation difficulties which make it impossible to ship needed supplies from one area to another.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Nov. 10th.—Meeting of the Biochemical Society, at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, 11.30 a.m.

Nov. 13th.—Autumn Meeting of the Eastern Counties Division, N.V.M.A., at Thetford (Guildhall), 2 p.m.

Nov. 14th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 2.30 p.m.

Nov. 14th.—Benjamin Ward Richardson Lecture on "The Economic and Public Health Advantages of Centralised Slaughtering," by W. Brennan deVine, M.C., F.R.C.V.S., D.V.S.M., Chief Veterinary Officer, Birmingham: Royal Sanitary Institute, 90, Buckingham Palace Road, S.W.1.

Nov. 15th.—Meeting of the Ayrshire Division, N.V.M.A., at Ayr (Hannah Institute), 2.30 p.m.

Nov. 15th.—Meeting of Lincolnshire and District, N.V.M.A., at Grantham (George Hotel), 2 p.m.

Nov. 17th.—Annual Meeting of the Society of Women Veterinary Surgeons, 69, Great Peter Street, Westminster, 2.15 p.m.

Nov. 17th.—Meeting of the Nutrition Society (English Group) at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, 11 a.m.

Nov. 28th.—Meeting of the West of Scotland Division, N.V.M.A., at Glasgow (George Hotel), 2.30 p.m.

Nov. 30th.—Meeting of the Royal Counties Division, N.V.M.A., at Reading (Caversham Bridge Hotel), 2.30 p.m.

Dec. 4th.—R.C.V.S. Written Examinations.

Dec. 5th.—R.C.V.S. Written Examinations.

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Release of Veterinary Surgeons from the Forces

Further Education and Training Scheme

A scheme has been authorised by the Minister of Labour and National Service, the Minister of Education, the Minister of Agriculture and Fisheries and the Secretary of State for Scotland to provide for the further education and training of veterinary surgeons and others released from the Forces. The scheme is a voluntary one and preliminary discussions have taken place at which the Royal College of Veterinary Surgeons and the National Veterinary Medical Association were represented, with a view to completing the necessary arrangements.

Practitioners' Panel to be Formed

For those returning to practice, an essential part of the scheme will be refresher courses in practice for those members of the Forces who may require them. It is a matter of considerable urgency that a comprehensive panel of practitioners shall be organised to accommodate members who are expected to be released from the Forces during the coming year.

Would all veterinary surgeons who have not already done so and who are able and willing to accept Service members in their practice on release to enable them to refresh their knowledge and experience of practice, please notify the General Secretary, N.V.M.A., 36, Gordon Square, London, W.C.1.

Information for Members in the Forces

Members in the Forces are advised to obtain from their Education Officer a copy of the pamphlet PL 120/1943, which explains the Further Education and Training Scheme in full. Full details of the special arrangements being made for veterinary surgeons in all branches of the profession will be published in *The Veterinary Record* as soon as they are available.

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R.C.V.S. OBITUARY

Hodgkins, John Rowland, D.S.O., F.R.C.V.S., Lieut.-Colonel, R.A.V.C. (retd.). Graduated London, July 13th, 1904: Fellow, May 17th, 1913. Died October 20th, 1945; aged 64 years.

Russell, Francis, 68, Bow Street, Lisburn, Co. Antrim. Graduated Glasgow, May 25th, 1897. Died October 24th, 1945.

Lt.-Col. J. R. Hodgkins, D.S.O., F.R.C.V.S.

It is with profound regret that we have to record the sudden death of Lt.-Col. J. R. Hodgkins, who succumbed to a heart attack on October 20th, 1945, at the Anglo-American Hospital, Cairo. He

was 64 years of age and had been carrying on his normal work until a few days before his death.

He qualified in 1904 and most of his life was spent in the Army. He served in India both before and after the Great War. In 1915 he formed No. 3 Veterinary Hospital and took it to Pont de Briques, near Boulogne.

In 1916 he was awarded the D.S.O. and later in the same year was Mentioned in Despatches.

He was a very proficient surgeon and in No. 3 Veterinary Hospital he had a great opportunity of carrying on this side of his profession.

He retired from the R.A.V.C. in 1935 and was appointed to take charge of the Brooke Memorial Veterinary Hospital in Cairo. This institution was originally founded for the purpose of caring for old and worn out ex-Army horses and mules which had been left in Egypt after the Great War. Later on it functioned as a Veterinary Hospital to which chiefly people of the poorer classes brought their donkeys, mules and ponies for treatment. Some really shocking cases of neglect and maltreatment were admitted, but Colonel Hodgkins went to work on what, to many people, appeared hopeless cases and in many instances got spectacular recoveries.

By nature he was shy and retiring, but professionally he was extremely keen and observant, ever anxious to try out new ideas and methods of treatment.

The funeral took place on Sunday, October 21st, at the Protestant Cemetery, Old Cairo, and was attended by a large number of his Cairo friends. Dr. Salem, Bey, Director of the Egyptian Veterinary Service, and members of his staff were there, Sir Charlton Spinks, Pacha, Mr. C. S. Burrell, Secretary of the Brooke Hospital, Mr. John Hamilton, of the Ministry of State, and many others. Colonel J. Judge, Major P. A. Reeves and Captains Pook, Gracey and Dyer attended on behalf of the R.A.V.C.

To his widow and his daughter and son we extend our deepest sympathy in their great loss.

MR. FRANK RUSSELL, M.R.C.V.S.

Mr. Frank Russell, who was a son of the late Mr. Francis Russell, M.R.C.V.S., Ballynahinch, after assisting his father for a short time set up for himself in Lisburn, where he quickly developed an extensive practice. About nine years ago he gave up private practice to become an inspector under the Ministry of Agriculture, a post which he held until his death.

Mr. Russell is survived by his wife, one daughter, Miss P. Russell, and two sons, Mr. John Russell, Toronto, who has just been demobilised from the Royal Canadian Air Force in which he was a flight-sergeant, and Flying-Officer Frank Russell, R.A.F.

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PERSONAL

Appointments.—Mr. G. E. M. Latimer, B.SC., M.R.C.V.S., is appointed in the Colonial Veterinary Service as Veterinary Officer, Nigeria.

Mr. H. E. Harbour, B.A., M.R.C.V.S., Veterinary Investigation Officer, Edinburgh and East of Scotland College of Agriculture, has been appointed to the staff of the Cooper Technical Bureau, Berkhamsted, Herts.

Births.—CARTER.—On October 26th, 1945, at Newbury House Nursing Home, to Ruth, wife of C. R. Carter, M.R.C.V.S., Hungerford, a daughter (Susan Mary).

GLYN.—On November 2nd, 1945, at 17, Trinity Street, Bungay, to Christine, wife of M. H. C. Glyn, M.R.C.V.S., a son.

Marriages.—HICKS—BROWN.—On November 1st, 1945, at All Saints' Church, Ruskinton, Major T. Hicks, of Highfield, Sleaford, to Ethel Brown (*née* Pattinson), of the Cottage, Dunsby, Bourne.

LAWFIELD—HOLDSTOCK.—On October 20th, 1945, at St. George's Cathedral, Jerusalem, by S/L. Langford-Sainsbury, Captain Frank Geoffrey Lawfield, R.A.V.C., son of Mr. and Mrs. H. C. Lawfield, of Cambridge, to S/O. Joyce Marjorie Holdstock, W.A.A.F., only daughter of Mr. H. Holdstock, of Loose, Kent.

SMITH—ALLOM.—On October 23rd, 1945, at St. Mary's Church, Norton-on-Tees, by Canon D. E. Sturt, Douglas, son of Mrs. O. M. Smith and the late Caleb Smith, of 44, Percy Gardens, Tynemouth, to Audrey (Pat), only daughter of Mr. and Mrs. Arthur Allom, of 33, Bradbury Road, Norton-on-Tees.

Mention in Despatches.—Major Reginald B. Griffiths, R.A.V.C., at present serving in Ceylon with S.E.A.C., has been mentioned in despatches in connection with his work in the Burma campaign, 1944.

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ADDRESSES OF DISEASE-INFECTED PREMISES

FOOT-AND-MOUTH DISEASE:

Beds.—Diaraba Pig Farm, Chalton Road, Houghton Regis (Nov. 2nd).

Berks.—Kimber's Lane Farm, Oakley Green, Windsor (Oct. 30th).

Derbyshire.—Melandra Farm, Gamesley, Glossop (Oct. 31st).

Yorks.—Gaping Goose Farm, Sutton-on-the-Forest, York (Oct. 31st).

SWINE FEVER:

Berks.—Main Street, Appleford, Abingdon (Nov. 1st).

Cambs.—Downham Road, Ely (Nov. 3rd).

Glamorgan.—77, Alltygrug Road, Ystalypera, Swansea (Nov. 1st).

Hunts.—Cherry Tree, Puddock Road, Warboys (Nov. 3rd).

Kent.—Woodside Farm, Grigg Lane, Headcorn, Ashford (Nov. 2nd).

Midlothian.—Inveresk Combination Institution, Musselburgh (Oct. 31st).

Norfolk.—Lodge Farm, Tivetshall St. Margaret, Norwich (Oct. 30th).

Northants.—The Homestead, Kislingbury, Northampton (Oct. 30th).

Yorks.—Water End, Holme-on-Spalding, Moor (Nov. 2nd).

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SCHEME FOR THE CONTROL OF DISEASES OF DAIRY CATTLE

STATEMENT SHOWING THE NUMBER OF UNDERTAKINGS NOTIFIED TO THE MINISTRY OF AGRICULTURE DURING THE MONTH ENDED OCTOBER 31ST, 1945

County	Undertakings Notified		Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
ENGLAND					
Bedford	—	37	37	874	523
Berks	—	92	92	3,157	1,981
Bucks	—	95	95	3,142	1,891
Cambridge	—	10	10	190	79
Chester	1	369	370	12,212	4,650
Cornwall	—	4	4	72	75
Cumberland	—	58	58	1,413	1,153
Derby	1	325	326	9,490	5,319
Devon	2	302	304	4,546	2,684
Dorset	—	67	67	2,100	1,123
Durham	1	266	267	5,702	2,352
Essex	—	222	222	7,056	4,030
Gloucester	—	95	95	2,523	1,722
Hampshire	1	385	386	10,950	7,613
Hereford	—	18	18	339	216
Hertford	1	80	81	2,429	1,531
Hunts	—	7	7	253	192
Isle of Ely	—	2	2	58	29
Isle of Wight	—	9	9	171	94
Kent	1	171	172	4,256	2,608
Lancs	1	185	186	5,415	1,348
Leics	2	100	102	2,506	1,862
Lincs (Holland)	—	3	3	25	11
Lincs (Kesteven)	—	23	23	320	168
Lincs (Lindsey)	1	106	107	2,096	1,255
Middlesex	—	13	13	414	212
Norfolk	—	157	157	4,848	3,257
Northants	1	76	77	2,231	1,861
Northumberland	—	62	62	2,036	1,134
Notts	—	180	180	3,981	2,438
Oxford	—	44	44	1,217	1,061
Rutland	—	8	8	156	107
Salop	—	257	257	7,572	3,811
Soke of Peterborough	—	—	—	—	—
Somerset	1	239	240	6,375	2,973
Staffs	1	196	197	5,710	3,470
Suffolk, E.	1	73	74	1,757	1,295
Suffolk, W.	1	45	46	977	613
Surrey	1	101	102	2,976	1,444
Sussex, E.	—	173	173	4,397	2,667
Sussex, W.	—	107	107	3,103	1,871
Warwick	2	130	132	3,061	2,085
Westmorland	—	13	13	354	444
Wilts	1	83	84	3,391	1,567
Worcester	—	154	154	2,969	1,507
Yorks, E.R.	1	95	96	1,487	918
Yorks, N.R.	—	109	109	3,235	1,368
Yorks, W.R.	2	248	250	6,062	2,270
WALES					
Anglesey	—	49	49	884	616
Brecon	—	11	11	168	99
Caernarvon	—	109	109	1,701	952
Cardigan	1	26	27	487	348
Carmarthen	2	251	253	4,685	2,486
Denbigh	—	42	42	869	453
Flint	—	113	113	2,538	1,140
Glamorgan	1	104	105	1,708	716
Merioneth	—	9	9	117	55
Monmouth	—	54	54	1,272	713
Montgomery	—	13	13	259	210
Pembroke	1	60	61	1,189	853
Radnor	—	—	—	—	—
TOTALS	29	6,435	6,464	165,391	93,023

Notes.—(1) Operative periods of undertakings: 1 year, 1,363; 2 years, 465; 3 years, 4,636. (2) Undertakings renewed for a further period: 1 year, 1,481; 2 years, 204; 3 years, 455. (3) Undertakings not renewed at end of operative period, 1,221. (4) The figures showing the number of undertakings notified during the month relate to entirely fresh undertakings and do not include undertakings renewed for a further period. Undertakings which have been cancelled or not renewed are not included in the figures for previous notifications.

County	Undertakings Notified		Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
SCOTLAND					
Aberdeen	1	18	19	903	380
Angus	—	17	17	646	351
Argyll	—	5	5	101	111
Ayr	—	24	24	760	561
Banff	—	1	1	120	20
Berwick	—	2	2	53	22
Bute	—	—	—	—	—
Caithness	—	—	—	—	—
Clackmannan ..	—	6	6	202	164
Dumfries	—	12	12	606	585
Dumbarton	1	3	4	165	126
East Lothian ..	—	3	3	145	88
Fife	—	34	34	1,271	663
Inverness	—	7	7	298	150
Kincardine	—	3	3	127	83
Kinross	—	3	3	56	40
Kirkcudbright ..	—	11	11	692	497
Lanark	—	19	19	730	549
Midlothian	—	—	—	—	—
Moray	—	—	—	—	—
Nairn	—	—	—	—	—
Orkney	—	—	—	—	—
Peebles	—	2	2	28	16
Perth	—	24	24	554	336
Renfrew	—	7	7	277	201
Ross-shire	—	2	2	58	52
Roxburgh	—	—	—	—	—
Selkirk	—	—	—	—	—
Stirling	—	23	23	722	588
Sutherland	—	4	4	80	44
West Lothian ..	—	1	1	23	18
Wigtown	—	25	25	1,676	1,019
Zetland	—	—	—	—	—
TOTALS ..	2	256	258	10,293	6,664

Notes.—(1) Duration of undertakings: 1 year, 36; 2 years, 10; 3 years, 212. (2) Undertakings renewed for a further period (included in column 2 of statement): 1 year, 43; 2 years, 7; 3 years, 15. (3) Undertakings expired and not renewed (not included in column 2 of statement): 121. (4) The figures showing the number of undertakings notified during the month relate to entirely fresh undertakings.

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DUBLIN COLLEGE PRIZE DISTRIBUTION

At the annual prize distribution at the Veterinary College, Ballsbridge, Dublin, the Principal, Professor T. G. Browne, occupied the chair and presented the prizes to the students.

Afterwards, Mr. D. D. Ogilvie, B.SC., M.R.C.V.S., of Imperial Chemical Industries, Ltd., gave an interesting and instructive demonstration of veterinary films.

Following is the prize list:—

Final Year.—M. T. I. Cronin—Silver Medals, Surgery and Clinique; Bronze Medal, Obstetrics. A. H. A. Hamilton—Silver Medal, Medicine. H. J. Hill—Bronze Medal, Medicine. B. T. Farrelly—Bronze Medals, Surgery and Obstetrics. C. J. Corcoran—Silver Medal, Clinique. H. Jordan—Bronze Medal, Meat Inspection. J. P. Richardson—Bronze Medal, Meat Inspection.

Fourth Year.—R. Lynch—Silver Medal, Pathology. T. O. Murphy—Silver Medal, Parasitology. J. T. Nicholson—Bronze Medals, Pathology and Parasitology.

Third Year.—W. J. Prendergast—Silver Medals, Anatomy, Materia Medica and Hygiene. J. A. Devereux—Bronze Medal, Anatomy. H. Martin—Bronze Medals, Hygiene and Materia Medica. Miss J. Bradbury—Bronze Medal, Materia Medica. D. Loughlin—Silver Medal, Animal Management.

Second Year.—D. Loughlin—Silver Medals, Physiology and Junior Anatomy; Bronze Medal, Histology. J. G. McIvor—Bronze Medal, Physiology. E. A. Walsh—Bronze Medal, Junior Anatomy.

First Year.—G. M. Gilchrist—Bronze Medals, Chemistry (Practical), Chemistry, Biology.

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UNIVERSITY OF EDINBURGH DEGREE OF B.V.Sc.

At the Graduation Ceremony of the University of Edinburgh held on Saturday, October 27th, 1945, the following students of the Royal (Dick) Veterinary College, Edinburgh, received the Degree of B.Sc. in Veterinary Science: Beynon, Reginald Seaton; Bridge, Peter Sadler; Fairclough, Richard Rowland; Grant, Derek Livingstone; Sharman, George Alistair Miller, and Wallace, Richard John Linton.

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ADVANCE IN MALARIA THERAPY

This week there has been announced, after extensive clinical trial, the successful application of a new drug, to be distributed in a form known as Paludrine, which, it is claimed, marks a revolutionary departure in anti-malarial research, since it is a much simpler chemical compound than any anti-malarial drug previously known. It is much more powerful and has a much wider influence upon malaria than any known specific. These researches have been carried out by a combined I.C.I. team of organic chemists and biologists at Blackley, near Manchester, in collaboration with the Medical Research Council. Paludrine is stated to be not only more effective but considerably less toxic than either quinine or mepacrine.

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FIFTIETH ANNIVERSARY OF THE DISCOVERY OF X-RAYS

During the past week the Royal Society, the Royal Institution, and the Royal Society of Medicine have been celebrating the 50th anniversary of the discovery of X-rays.

When, in 1895, Wilhelm Conrad Röntgen, experimenting with the conduction of electricity through gases and using a vacuum tube, noticed that a screen covered with a special chemical became fluorescent when the electric current was passing through the tube, although this was in fact enclosed in a box, he applied the term "X-ray" to this novel form of radiation because of the many puzzling features that it possessed (states *The Times* of Monday last), and continues: "The 50 years that have elapsed since have seen developments of a truly amazing kind. In the realm of medical diagnosis X-rays have become indispensable for surgeon and physician alike. Mass radiography is a modern development allowing of a rapid, wholesale survey of the state of lungs. Cine-radiography may yet prove a valuable method for the study of body function.

"The whole study of electronic radiation took a new turn with Röntgen's discovery. The X-rays he described came from the cathode in his vacuum tube. Cathode rays to-day are the essential mechanism behind Radar and television. The electron microscope, which can magnify a red blood corpuscle to a diameter of over seven yards, is a further development. Still more elaborate is the bombarding of the atom by X-radiation, which led to the original splitting of the atom and, by a war-time spurt, to the atomic bomb. Such, in only 50 years, has been the dramatic evolution of an almost chance discovery, a discovery both rich and terrifying in its possibilities. The developments of Röntgen's work, in which British workers, many of them martyrs in the early days of unrecognised danger, have played a notable part, will be discussed by many scientists in the next few days. The future of the civilised world in the next 50 years is intimately concerned with the subjects of their discussion."

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GRAVE WORLD FOOD SITUATION

The United States Agricultural Department on the last day of September issued from Washington a report on the world food situation which it characterises as being "increasingly grave" for the ensuing winter, by reason of diminishing stocks. It is estimated that the total world farm production of food in 1945-46 is about 3 per cent. less than the pre-war average in terms of calories, while output per head would be about 10 per cent. less if allowance is made for the net increase in population during the war. Meanwhile, carry over stocks of the major foods have been sharply reduced. The food outlook is serious in Continental Europe which (excluding the Soviet Union) will be short of about 18,000,000 tons of having enough food this year to maintain rations moderately above the war-time levels in liberated countries, and to prevent widespread disease and unrest among urban populations in the conquered areas. Because of war and drought, Europe (again excluding the U.S.S.R.) and North Africa have shown greater declines in production than any other geographic area, production for the region being probably 25 per cent. below pre-war. The outlook in the Far East also is serious, though not so bad as in Europe; and it is stated that China will be short by about 2,000,000 tons of wheat and rice of having enough food to avert an acute shortage in urban areas, while India's shortage will be about the same, and even greater should bad weather reduce its rice crop below early estimates.

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HUMAN PASTEURELLA INFECTION FOLLOWING BITES FROM ANIMALS

In the issue of *The Lancet* of June 16th, 1945, Dr. T. V. Cooper, Pathologist to the Dorset County Council, and Dr. B. Moore, Assistant Bacteriologist, Emergency Public Health Laboratory, Oxford, record, at pages 753-4, a case of *Pasteurella septica* infection which followed a cat-bite. In their introduction the authors state:—

"A number of cases have now been reported in which organisms identified as *Pasteurella septica* were isolated from wounds caused by animal bites. These cases have all shown a more or less common clinical pattern of acute onset of pain and swelling following the bite and a curiously indolent subsequent course, often with necrosis of underlying bones and the formation of abscesses. Most of the recorded cases have required wide surgical incision but have thereafter slowly recovered. Cats have generally been responsible for this infection, but Boisvert and Fousek (1941) reported

Past. septica infection of a rabbit-bite; and Allott and his colleagues (1944), who published the first reports in this country of similar cases, included three dog-bites in their series."

At page 761 of the same issue *The Lancet* publishes the following annotation on human pasteurella infections:—

Pasteurellosis is a common infection in many animal species. It usually takes the form of an acute haemorrhagic septicaemia, but a chronic infection—called pseudo-tuberculosis because of nodules in liver and lungs and enlarged caseous glands—occurs in guinea-pigs, rats, and cats, while rabbit snuffles is an example of a localised pasteurella infection. Pasteurella organisms are to be found in the upper respiratory tract of such domestic animals as cow, pig, cat, and rabbit; yet it is only within the past year that human infection with *Pasteurella septica* has been recorded in this country, though two of the six cases quoted by Allott and his colleagues[1] occurred ten years ago. These *Past. septica* infections have usually followed wounds by cat-bites, which are proverbially slow to heal. There is as a rule an immediate oedematous inflammation which soon settles down to a low-grade suppurative process with subacute osteomyelitis as a common complication; regional adenitis, reminiscent of bubonic plague (which likewise is a pasteurella infection) and tularaemia, has been prominent in some cases. While the cat is the usual culprit, as in the typical case reported by Cooper and Moore in our present issue, three of the six cases reported by the L.C.C. pathologists followed dog-bites, and it is noteworthy that these were seen within three months in north-west London, which suggests a dog epizoötic of pasteurellosis at that time. These cases are apparently the first recorded instances of human pasteurella infection following dog-bites and they should encourage more careful bacteriological examination of such wounds.

Past. septica, a gram-negative coccobacillus with some tendency to pleomorphism, grows rather poorly as small glistening translucent colonies on ordinary culture media, and may easily be missed in the presence of secondary infecting organisms like *Staph. aureus*. Its main distinguishing features are its failure to grow on MacConkey's medium and its high pathogenicity for laboratory animals, with peritonitis and pericarditis common findings. While infection of animal bites is the usual form of pasteurellosis in man, the organism has been isolated from infected pleural cavities, and Ludlam[2] has lately reported an instance of appendicular abscess due to *Past. septica*, while Robinson[3] records a case of pasteurella septicaemia and septic arthritis in an African native. Thus it seems that these organisms are sometimes inhaled or ingested and may set up infections in different parts of the body.

[1] Allott, E. N., Cruickshank, R., Cyrlas-Williams, R., Glass V., Meyer, I. H., Straker, E. A., Tee, G. *J. Path. Bact.* 1944. **56.** 411.
[2] Ludlam, G B. *Ibid.* 1944. **56.** 307.
[3] Robinson. R. *Brit. med. J.* 1944. ii, 725.

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The addition of charcoal to santonin, oil of chenopodium, or carbon tetrachloride reduces the toxicity of these drugs without interfering with anthelmintic efficacy.—*Ind. J. vet. Sci.*

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Cumberland Agricultural Committee has passed a resolution asking the Government to expand the veterinary service in view of the prevalence of farm stock diseases.

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Gordon Richards' Feat.—An interesting feature of the racing at Newmarket on October 31st—when the Cambridgeshire was run—was the success of G. Richards, who had the great satisfaction of riding the 3,000th winner of his great career. This was Exotic in the Icklingham Stakes. When, a furlong from home, it was seen that he was in a challenging position, cheers were raised, and Richards had a great, and thoroughly deserved, reception at the end of the race. He is the first jockey ever to accomplish this feat on the British turf, but the record is held by S. Heapy with 3,260 winners in Belgium.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

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VETERINARY EDUCATION

Sir,—The correspondence on veterinary education has become so involved and repetitive, so overlaid with personalities, that I had intended to take no further part in it. But the letter in your issue of October 27th from my esteemed predecessor in this practice, Major J. J. Dunlop, shows such fundamental misconceptions of the aim of education in general, of veterinary education in particular, and of the spirit of the universities, that I feel impelled to make a brief comment.

Education, as is implicit in the word itself, is a process of "drawing out," not of stuffing in; its aim should be to make the student so order his life that he is learning, because he wants to learn and knows how to learn, for the whole of his life. It is as different from mere instruction as chalk from cheese; and veterinary education, despite its immense factual requirements, can be an education in its fullest sense if the environment is one that can give that inspiration to the student—whether he is of "the right type" or not. What is "the right type?" The emphasis constantly laid on it seems to me to show evidence of a sort of mental glaucoma; my neighbours and I are all utterly different types, mentally, physically, psychologically; but we are all successful veterinary surgeons. Conversely, one can think of successful veterinary surgeons who by any conceivably applicable standard are not "the right type." The strength of the universities, with their great and jealously guarded traditions of liberalism in the arts, in science, in philosophy, lies in their freedom from the fetish of "the right type." So the proposal that veterinary surgeons be turned out by them "as from a sausage machine" (J.J.D.) *would* be just nonsense, had it ever been made. As it has not, one wonders whether Major Dunlop and our other Isolationists have ever read the Loveday Report, let alone understood its implications.

There has been a dangerous over-simplification of the issue; it is not merely, as some of your correspondents appear to believe, a question of who examines and who licences; it is whether we go forward alone, or as members of a goodly company, members who have the courage and vision to sacrifice, if need be, something of the great heritage of the past to the glory of the future.

Yours faithfully,

Chipping Norton, Oxon. PAUL CROSFIELD.
November 1st, 1945.

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CONFIRMATION OF SWINE FEVER OUTBREAKS

Sir,—I reported a case of suspected swine fever to the Ministry and now I see it is confirmed—*Veterinary Record*, October 20th—and that the date of confirmation was October 9th. That is the only information I have had. Surely the Ministry ought to have informed me by letter of the confirmation of this outbreak, so that I could keep a watch for other outbreaks.

Yours faithfully,

Evesham. G. C. LANCASTER.
October 23rd, 1945.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
Oct. 1st to 15th, 1945 ...	10	2	—	6	50
Corresponding period in—					
1944 ...	11	14	—	6	107
1943 ...	13	—	—	11	19
1942 ...	10	29	—	7	23
Total Jan. 1st to Oct. 15th, 1945	98	112	6	102	803
Corresponding period in—					
1944 ...	149	97	7	86	1,101
1943 ...	231	15	6	126	420
1942 ...	262	531	26	138	373

NOTE.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

Tuberculosis Order of 1938

The number of bovine animals slaughtered under the Tuberculosis Order of 1938 during the period July 1st to September 30th, 1945, was 2,077.